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Self-Reported Health and Patterns of Romantic Love in Adolescents from Eight European Countries and Regions

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Abstract

Purpose: Sexual minority youth (SMY) are at increased risk of poor health, but it remains unclear whether this phenomenon is universal. In this study, nationally representative samples of 15-year olds from eight European countries and regions were investigated to test if adolescents who have been in love with same- or both-gender partners report poorer health than those exclusively in love with opposite-gender partners or who have never been in love.
Methods: A subsample of 13,674 adolescents participating in the 2014 Health Behaviour in School-aged Children (HBSC) study was used. We conducted binary logistic regression, adjusted for gender, region, and relative family affluence, to analyze associations between self-reported romantic love, multiple psychosomatic symptoms, and poor self-rated health.
Results: Adolescents reporting same-gender love (adjusted odds ratio [aOR] = 1.50, 95% confidence interval [CI]: 1.11–2.02) and both-gender love (aOR = 3.57, 95% CI: 2.65–4.83) had significantly higher odds for multiple psychosomatic symptoms than those who reported opposite-gender love. Similarly, both SMY groups had higher odds of poor self-rated health (aOR = 2.95, 95% CI: 1.64–5.31 and aOR = 3.08, 95% CI: 1.79–5.31, respectively). Those who reported that they have never been in love had significantly lower odds for multiple symptoms. Adjustment for sociodemographic variables and stratifying by gender did not substantially change the odds ratios.
Conclusion: Adolescents in love with same- and both-gender partners reported poorer subjective health outcomes than those in love with opposite-gender partners or who reported never being in love, suggesting that SMY health inequalities are found across various European countries and regions.

Keywords: adolescence, epidemiology, health disparities, international research (research outside the US), minority stress

Introduction

Lesbian, gay, or bisexual adults experience worse health across different psychological and physical conditions than their heterosexual counterparts, and many of these health inequalities can be traced back to adolescence.[1,2] The adverse health experiences of these groups can be explained by the minority stress model,[3–5] which posits that various stressors (e.g., prejudices, hostility, concealment, and internalized homophobia) maintain a constant

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anticipation of exclusion, rejection, and discrimination, and these may be lived experiences to minority individuals. Such stressors can have a negative impact on mental and physical health.

Mental health disparities are reflected in elevated risk for depression, anxiety, and self-harm[6,7]; inequalities in physical health can be manifested in poor self-reported general health and elevated risk of health problems such as cancer, cardiovascular diseases, asthma, diabetes, and other chronic conditions.[8] Besides the direct impact of minority stress, these inequalities may be attributed, in part, to avoidance of health care due to discrimination and stigmatization that sexual minority individuals experience or anticipate in health care settings.[9] These stressors appear to begin during adolescence, as do the health disparities.[6]

In recent decades, many Western countries have markedly improved public support for gender and sexual minority individuals. In parallel, sexual minority youth (SMY) are ''coming out'' (disclosing their sexual orientation) at increasingly younger ages.[10] However, health inequalities for SMY seem to persist.[11,12] This paradox could be the consequence of intersecting processes.[13] SMY coming out during adolescence are likely to face their peers' prejudicial attitudes and homophobic, biphobic, or transphobic behavior, which also appear to peak during adolescence[14] and do not seem to be improving over time.[15] Based on the minority stress theory, one mechanism of (persistent) poor health is the chronic stress caused by anticipated or experienced homophobic violence and bullying.[16–18] Such stress may also amplify attention to bodily processes and thus may be a causal factor in somatization disorders.[19] Bisexual or both-gender attracted individuals may be at even higher risk than those who identify as lesbian/gay (or exclusively attracted to same-gender partners).[20,21]

There are several gaps in understanding health disparities in SMY. First, homophobic bullying experienced in adolescence may have long-term negative impacts on health[22]; however, this has not been demonstrated conclusively. Second, research so far has not focused on whether SMY report poorer subjective health or more somatic symptoms than their heterosexual peers despite the fact that subjective health indicators seem to be sensitive predictors of poor health in later life.[23,24] To the best of our knowledge, self-rated health or the frequency of psychosomatic symptoms among SMY has not been investigated in epidemiological studies, neither in North America nor in other countries. Third, most studies presented terms such as ''lesbian,'' ''gay,'' or ''bisexual'' to the respondents to categorize SMY, even with children as young as 9 or 10.[25] Such terms may exclude adolescents who have not yet defined their sexual identity.[26] Other sexual orientations, gender identities (e.g., queer or intersex),[27] and dimensions of sexual orientation (e.g., sexual behavior or romantic attraction) remain relatively understudied.[28,29]

Using romantic attraction to estimate SMY health inequalities may be more inclusive and suitable for young adolescents than terms indicating self-identified sexual orientation.[30] Romantic attraction can be understood as a desire for intimate emotional bonding. It is a concept closely related to the feeling of love and is an essential element of sexual orientation,[31] although it is often neglected in the studies of sexual minority individuals. Fourth, in many studies those who are unsure about or do not want to disclose their sexual orientation are excluded from the analyses.[32] Finally, although some national studies have been conducted on the health of SMY in Europe, for instance, in Iceland,[33,34] Ireland,[35–37] The Netherlands,[38] and the United Kingdom,[39] most of the existing findings are from North America, and it remains unclear whether their findings can be generalized to other countries and cultures.[40,41]

This study investigates associations between patterns of romantic love and self-rated health and multiple health symptoms, in nationally representative samples of 15-year-old adolescents in eight European countries and regions. We hypothesized that adolescents reporting same- or both-gender love would have higher odds of multiple psychosomatic symptoms and poor self-rated health than those who reported being in love only with opposite-gender partners or who had never been in love. Based on available evidence of bisexual or both-gender attracted adolescents,[20,42,43] we anticipated that adolescents reporting both-gender love may be at even higher risk of reporting poor health and multiple symptoms than those reporting exclusive same-gender love. Participants who did not respond to the question on love (no answer) were included in the analyses as a separate group.

Methods

The Health Behaviour in School-aged Children (HBSC), a World Health Organization collaborative cross-cultural study, is an epidemiological survey of health-related behaviors in nationally representative samples of 11-, 13-, and 15-year-old schoolchildren across 50 countries in Europe and North America. The methodology used in HBSC is described in detail elsewhere.[44,45] In 2014, HBSC researchers introduced an optional measure on romantic attraction, which national research teams could include in the survey conducted in the given country.[30] Research teams from eight countries and regions (French Belgium, Bulgaria, Switzerland, England, France, Hungary, Iceland, and North Macedonia) administered this item to their 15-year olds. The final sample included 14,545 adolescents ($M_{age} = 15.55$ years, standard deviation = 0.33, range: 14.58–16.50). For the analysis, we used data of those 13,674 adolescents (94.0% of the total sample) who provided responses to all items of the Family Affluence Scale (FAS).

Ethical approval was obtained at a national level from higher education or health authorities. The national teams decided whether they obtained informed, passive, or active consent from schools, parents, and pupils to participate in the study (Table 1).[45] Informed consent refers to providing information in leaflets, letters, and within the classrooms informing children of their rights, so that they can give their consent by filling in the questionnaire.[46] Active consent implies that the parent/guardian must explicitly give permission for their child to participate (none of the ethical authorities in the eight countries feeding data into this analysis required active consent at any level). Passive consent implies that the child is permitted to participate unless the parent/guardian indicates that the child should not participate. A paper-pencil format questionnaire was used in each participating country. Before administering the questionnaire, pupils were instructed that they were free not to answer any questions and/or to withdraw participation at any time. Anonymity and confidentiality were assured.

Table 1. Names of Authorities Providing Ethical Approval and Type of Consent at School, Parental, and Pupil Level in Those Eight Countries/Regions of the Health Behaviour in School-Aged Children Study (2014) Which Provided Data for the Present Analyses

		Type of consent		
Country/region	*Authority providing ethical approval*	*School level*	*Parental level*	*Pupil level*
Belgium (French)	Boards of school networks of the Wallonia-Brussels Federation	Informed	No consent	Passive
Bulgaria	Ministry of Education and Science	Informed	Informed	Informed
Switzerland	University of Lausanne, Cantonal Commission for Ethics for the Research on Human Beings	Informed	No consent	Informed
England	University of Hertfordshire, Ethics Committee for Studies Involving Human Participants	Informed	Passive	Passive
France	Ministry of Education and the French National Commission of Computer Science and Freedom	Passive	Passive	Passive
Hungary	Scientific and Research Ethics Committee of the Medical Research Council	Informed	Passive	Informed
Iceland	Icelandic Data Committee	Informed	Passive	Informed
North Macedonia	Ministry of Education and Science and Ministry of Health	Passive	Passive	Informed

Measures

Romantic love. One item was used to classify respondents' love patterns: ''Have you ever been in love with someone?'' Response options were as follows: ''Yes, with a girl or girls,'' ''Yes, with a boy or boys,'' ''Yes, with girls and boys,'' and ''No, never.'' Development of this item has been reported elsewhere.[30] Boys who reported having been exclusively in love with girls, and girls who reported having been exclusively in love with boys were categorized as having experience exclusively of opposite-gender love. Boys who reported having been in love with boys, and girls who reported having been in love with girls were categorized as having experience exclusively of same-gender love. Respondents who reported having been in love with both girls and boys were categorized as having experience of both-gender love. Those who reported never having been in love were categorized as never in love. For the present analyses, we also involved participants who did not answer the question on love (no answer). Opposite-gender love was used as the reference category.

Multiple symptoms. A standardized eight-item psychosomatic symptom checklist[47] was used to assess the experience of symptoms. Respondents had to indicate how often they experienced (1) headache, (2) stomach ache, (3) backache, (4) feeling low, (5) irritability or bad temper, (6) feeling nervous, (7) difficulties in getting to sleep, and (8) feeling dizzy in the past 6 months (Cronbach's alpha = 0.83). The five response options ranged from ''about every day'' to ''never.'' A dichotomous variable was created to identify respondents with recurrent multiple health symptoms: those who had two or more health symptoms more than once a week or about every day during the past 6 months (0 = did not report multiple symptoms, 1 = reported having multiple symptoms).[48] The reference category comprised those who reported fewer than two symptoms in the same time frame.

Poor self-rated health. Young people's self-reported health was assessed using the item[44]: Would you say your health is …? with response options being (1) ''Excellent,'' (2) ''Good,'' (3) ''Fair,'' or (4) ''Poor.'' Responses were dichotomized into favorable versus unfavorable evaluation (0 = excellent to fair health, 1 = poor health).[49] Excellent to fair health was the reference category.

Sociodemographic variables. Respondents were asked if they were a boy or a girl (one response option to be chosen). Comparative socioeconomic status was assessed by the FAS, a six-item composite measure developed by the HBSC network.[50–52] For the current analysis, the absolute FAS scores (ranging between 0 and 13) were transformed to a ridit-based relative score and grouped into three categories: the bottom 20% of the young people into low affluence families, 60% into families with medium level affluence, and top 20% into the most affluent families.[44] An eight-category nominal variable indicated the regions/countries in the analysis. Boys, children from the lowest 20% family affluence category and residents of French Belgium, were used as reference categories in the logistic regression models.

Statistical analysis

Descriptive statistics and logistic regression models. Analyses were carried out in SPSS 24.0 (IBM Corp., Armonk, NY). Associations of love with the sociodemographic variables and health outcomes were checked in the unweighted sample using Chi-square tests. We used uni- and multivariate logistic regression models to explore the odds of reporting multiple symptoms and poor self-rated health across categories of romantic love. Univariate models were built to obtain crude odds ratios. Country/region, relative family affluence, and gender were entered into the multivariate models to obtain adjusted odds ratios (aORs). Model fit was verified. No multicollinearity was detected in the predictor variables. To test the potential confounding effect of interactions between the predictor variables, we built multivariate models that included two-way interaction terms. However, as these did not improve model fit, they were not included in the final multivariate models.

Weighting and adjustment for clustering. The decision regarding whether to weight data to account for imbalances in school, class, or sociodemographic composition is at the

discretion of HBSC national teams. Of the eight countries included in the analysis, only the French data had been weighted. Therefore, in the logistic models we used a weight variable that had actual values for the French data, whereas for other countries it was set at 1. To check the potential impact of cluster-based sampling, we applied the Complex Samples function on SPSS, adjusting analyses for classrooms as sampling units. Design effects in the multivariate models, adjusted for clusters, ranged from 0.938 to 1.161, and subsequent analyses did not substantially differ from treating our data as a simple random sample. Therefore, reported analyses have not been adjusted for clustering.

Multiple imputation. To reduce potential bias caused by missing data, multiple imputation with chained equations was used to impute missing values for psychosomatic symptoms and self-rated health. For psychosomatic symptoms, rates of missing responses ranged from 1.5% (headache) to 1.8% (irritability or bad temper); the listwise rate of missing responses was 2.3%. For self-rated health, the percentage of missing responses was 0.9%. There was a significant association between missing responses in the combined number of psychosomatic symptoms and love: $\chi^2(4) = 809.58$, $p < 0.001$, with a large effect size[53]: $V = 0.236$. A similar significant association was found between missing responses in self-rated health and love: $\chi^2(4) = 393.64$, $p < 0.001$, with a medium effect size: $V = 0.165$. This indicates that responses on the outcome variables are not missing at random. It is suggested, though, that listwise deletion may lead to more biased estimates than multiple imputation, even when the condition for this technique that data are missing at random, is not met.[54] Twenty imputed datasets were created, and the imputation diagnostics were examined.

Results

Love and sociodemographic characteristics

Love was associated with country/region: $\chi^2(28) = 1631.74$, $p < 0.001$, although the effect size was low: $V = 0.173$. In all countries, opposite-gender love was the most frequently reported category, while same-gender love was the least frequent (Table 2). Love and gender were also significantly associated: $\chi^2(4) = 89.06$, $p < 0.001$, although the effect size was low: $V = 0.081$. In both boys and girls, opposite-gender love was reported at the highest rates (83.4% and 78.9%, respectively); in boys, the least reported category was both-gender love (1.1%), whereas for girls it was same-gender love (1.8%) (Table 2). We also found associations between love and relative family affluence groups: $\chi^2(8) = 38.15$, $p < 0.001$, but with a marginal effect: $V = 0.037$.

Love and self-reported health outcomes

Love and multiple symptoms were associated: $\chi^2(4) = 159.65$, $p < 0.001$, but the effect size was low: $V = 0.108$. The proportion of adolescents reporting both-gender love was higher within the group of adolescents who reported multiple symptoms (3.3%) than within those who did not (0.8%) (Table 2). A similar difference, although at a lower ratio, was found in the subsample of adolescents reporting same-gender love (2.2% vs. 1.2%, respectively). Love was also associated with reporting poor health: $\chi^2(4) = 33.50$, $p < 0.001$, but the magnitude of the effect was low: $V = 0.050$. Adolescents reporting same-gender or both-gender love were more likely to report poor subjective health compared to their opposite-gender love peers.

Multiple symptoms across love patterns

Both univariate and multivariate logistic regression models (Table 3) highlighted that adolescents reporting same-gender love (aOR = 1.50, 95% confidence interval [CI]: 1.11–2.02) and, to a greater extent, those reporting both-gender love (aOR = 3.57, 95% CI: 2.65–4.83) had significantly higher odds of reporting multiple symptoms compared to adolescents reporting opposite-gender love. Those who had never been in love had significantly lower odds of reporting multiple symptoms relative to the opposite-gender love group (aOR = 0.68, 95% CI: 0.61–0.77). Nonrespondents had similar odds for multiple symptoms as adolescents reporting opposite-gender love.

Reporting multiple symptoms followed a similar pattern in boys and girls across different love patterns, with one notable exception. Boys reporting same-gender love had a significantly higher odds of reporting multiple symptoms compared to boys reporting opposite-gender love (aOR = 2.24, 95% CI: 1.48–3.38); in girls, no significant difference was observed. No gender differences were detected among young people reporting both-gender love and those who had never been in love.

Poor self-rated health across love patterns

After adjustment for demographic variables (Table 4), adolescents reporting same-gender love (aOR = 2.95, 95% CI: 1.64–5.31) and both-gender love (aOR = 3.08, 95% CI: 1.79–5.31) had significantly higher odds of poor self-rated health than their opposite-gender love peers. The ''never in love'' and ''no answer'' groups did not differ from adolescents reporting opposite-gender love. Boys reporting both-gender love had higher odds of poor self-rated health than their opposite-gender love peers (aOR = 5.07, 95% CI: 1.94–13.28); this was also the case for girls reporting both-gender love (aOR = 2.55, 95% CI: 1.34–4.88). The odds of poor self-rated health was also higher among boys reporting same-gender love than among their opposite-gender counterparts, but at the limit of statistical significance (aOR = 2.72, 95% CI: 0.99–7.43). Girls reporting same-gender love had significantly higher odds compared to girls reporting opposite-gender love (aOR = 3.07, 95% CI: 1.47–6.41).

Discussion

This study investigated the associations between romantic love and different self-reported health outcomes among nationally representative samples of 15-year olds across eight European countries and regions. After adjusting for country/region, relative family affluence, and gender, adolescents reporting same-gender love and, even more so, those reporting both-gender love had higher odds of reporting multiple symptoms and rating their health as poor compared to their opposite-gender love peers. This pattern was similar across boys and girls, except for girls reporting same-gender love whose odds for multiple symptoms, and boys reporting

Table 2. Characteristics of the Sample, Overall and by Romantic Love, in the Health Behaviour in School-Aged Children Study, 2014

	Total sample (n = *13,674*)		*Opposite-gender love* (n = *11,098*)		*Same-gender love* (n = *222*)		*Both-gender love* (n = *250*)		*Never in love* (n = *1766*)		*No answer* (n = *338*)		
	n	*Overall %*	n	*% (Love)*	n	*% (Love)*	n	*% (Love)*	n	*% (Love)*	n	*% (Love)*	*Assoc.*
Love													
Opposite-gender love	11098	81.2											
Same-gender love	222	1.6											
Both-gender love	250	1.8											
Never in love	1766	12.9											
No answer	338	2.5											
Country/region													
Belgium (French)	1807	13.2	1491	82.5	28	1.5	24	1.3	223	12.3	41	2.3	$p < 0.001$,
Bulgaria	1564	11.4	1325	84.7	63	4.0	39	2.5	116	7.4	21	1.3	$V = 0.173$
Switzerland	1696	12.4	1507	88.9	9	0.5	21	1.2	149	8.8	10	0.6	
England	1453	10.6	756	52.0	23	1.6	38	2.6	579	39.8	57	3.9	
France	1669	12.2	1370	82.1	34	2.0	33	2.0	212	12.7	20	1.2	
Hungary	1085	7.9	854	78.7	4	0.4	16	1.5	129	11.9	82	7.6	
Iceland	2984	21.8	2710	90.8	49	1.6	57	1.9	152	5.1	16	0.5	
North Macedonia	1416	10.4	1085	76.6	12	0.8	22	1.6	206	14.5	91	6.4	
Gender													
Boy	6778	49.6	5656	83.4	97	1.4	72	1.1	767	11.3	186	2.7	$p < 0.001$,
Girl	6896	50.4	5442	78.9	125	1.8	178	2.6	999	14.5	152	2.2	$V = 0.081$
Relative family affluence													
Lowest 20%	2855	20.9	2237	78.4	70	2.5	65	2.3	395	13.8	88	3.1	$p < 0.001$,
Medium 60%	8181	59.8	6661	81.4	113	1.4	146	1.8	1077	13.2	184	2.2	$V = 0.037$
Highest 20%	2638	19.3	2200	83.4	39	1.5	39	1.5	294	11.1	66	2.5	
Multiple health symptoms													
No	8056	58.9	6543	81.2	98	1.2	64	0.8	1150	14.3	201	2.5	$p < 0.001$,
Yes	5618	41.1	4555	81.1	124	2.2	186	3.3	616	11.0	137	2.4	$V = 0.108$
Poor self-rated health													
No	13365	97.7	10865	81.3	209	1.6	234	1.8	1727	12.9	330	2.5	$p < 0.001$,
Yes	309	2.3	233	75.4	13	4.2	16	5.2	39	12.6	8	2.6	$V = 0.050$

Assoc., association between the given variable and love; % (Love), proportion within the given love category; *n*, unweighted sample size; Overall %, proportion in the overall sample in percentage.

Table 3. Crude and Adjusted Odds for Multiple Health Symptoms, Overall and by Gender, in the Health Behaviour in School-Aged Children Study, 2014

	Univariate model (n = *13,674*)			*Multivariate model (overall;* n = *13,674*)			*Multivariate model stratified by gender*					
							Boys (n = *6778*)			*Girls* (n = *6896*)		
	cOR	p	*95% CI*	*aOR*	p	*95% CI*	*aOR*	p	*95% CI*	*aOR*	p	*95% CI*
Love												
Opposite-gender love	1			1			1			1		
Same-gender love	1.73	<0.001	1.32–2.28	**1.50**	0.008	1.11–2.02	**2.24**	<0.001	1.48–3.38	1.08	0.691	0.74–1.58
Both-gender love	4.27	<0.001	3.20–5.70	**3.57**	<0.001	2.65–4.83	**4.29**	<0.001	2.62–7.03	**3.22**	<0.001	2.23–4.65
Never in love	0.77	<0.001	0.69–0.87	**0.68**	<0.001	0.61–0.77	**0.69**	<0.001	0.57–0.83	**0.68**	<0.001	0.58–0.78
No answer	0.96	0.744	0.77–1.20	0.96	0.706	0.76–1.21	1.15	0.381	0.84–1.59	0.78	0.144	0.56–1.09
Country/region												
Belgium (French)				1			1			1		
Bulgaria				1.07	0.349	0.93–1.23	0.93	0.540	0.77–1.15	1.19	0.082	0.98–1.47
Switzerland				**0.54**	<0.001	0.47–0.62	**0.51**	<0.001	0.41–0.63	**0.57**	<0.001	0.47–0.69
England				0.86	0.054	0.75–1.00	**0.76**	0.017	0.61–0.95	0.96	0.651	0.78–1.17
France				1.11	0.170	0.96–1.28	0.97	0.787	0.79–1.20	**1.23**	0.035	1.01–1.50
Hungary				**0.81**	0.010	0.69–0.95	**0.73**	0.010	0.58–0.93	0.88	0.218	0.71–1.08
Iceland				**0.75**	<0.001	0.66–0.85	**0.68**	<0.001	0.57–0.82	**0.80**	0.009	0.68–0.95
North Macedonia				0.90	0.144	0.78–1.04	0.81	0.058	0.66–1.01	0.97	0.769	0.80–1.18
Relative family affluence												
Lowest 20%				1			1			1		
Medium 60%				**0.87**	0.003	0.79–0.95	**0.85**	0.020	0.75–0.98	0.88	0.051	0.78–1.00
Highest 20%				**0.86**	0.007	0.77–0.96	**0.80**	0.010	0.68–0.95	0.90	0.182	0.77–1.05
Gender												
Boy				1								
Girl				**2.58**	<0.001	2.40–2.77						

Boldface indicates statistically significant ($p < 0.05$) aOR for the association between multiple health symptoms and the given predictor, adjusting for all other coefficients in the model. aOR, odds ratios adjusted for country/region, relative family affluence, and gender; CI, confidence interval; cOR, crude odds ratio.

Table 4. Crude and Adjusted Odds for Poor Self-Rated Health, Overall and by Gender, in the Health Behaviour in School-Aged Children Study, 2014

	Univariate model (n = *13,674*)			*Multivariate model (overall;* n = *13,674*)			*Multivariate model stratified by gender*					
							Boys (n = *6778*)			*Girls* (n = *6896*)		
	cOR	p	*95% CI*	*aOR*	p	*95% CI*	*aOR*	p	*95% CI*	*aOR*	p	*95% CI*
Love												
Opposite-gender love	1			1			1			1		
Same-gender love	2.81	<0.001	1.58–5.01	**2.95**	<0.001	1.64–5.31	2.72	0.052	0.99–7.43	**3.07**	0.003	1.47–6.41
Both-gender love	3.16	<0.001	1.87–5.33	**3.08**	<0.001	1.79–5.31	**5.07**	0.001	1.94–13.28	**2.55**	0.005	1.34–4.88
Never in love	1.05	0.793	0.74–1.48	1.01	0.948	0.70–1.47	1.45	0.172	0.85–2.49	0.78	0.337	0.47–1.30
No answer	1.12	0.755	0.55–2.29	1.10	0.798	0.53–2.27	0.89	0.858	0.28–2.93	1.27	0.606	0.51–3.20
Country/region												
Belgium (French)				1			1			1		
Bulgaria				**0.09**	<0.001	0.04–0.18	**0.17**	<0.001	0.07–0.42	**0.04**	<0.001	0.01–0.15
Switzerland				**0.09**	<0.001	0.04–0.18	**0.19**	<0.001	0.08–0.47	**0.03**	<0.001	0.01–0.13
England				**0.39**	<0.001	0.26–0.60	**0.48**	0.025	0.25–0.91	**0.34**	<0.001	0.19–0.59
France				**0.38**	<0.001	0.25–0.59	**0.45**	0.022	0.23–0.89	**0.35**	<0.001	0.20–0.60
Hungary				**0.65**	0.028	0.44–0.95	0.85	0.619	0.46–1.60	**0.55**	0.020	0.33–0.91
Iceland				**0.53**	<0.001	0.40–0.72	0.65	0.093	0.39–1.07	**0.48**	<0.001	0.33–0.70
North Macedonia				**0.10**	<0.001	0.05–0.21	**0.11**	<0.001	0.04–0.37	**0.10**	<0.001	0.04–0.24
Relative family affluence												
Lowest 20%				1			1			1		
Medium 60%				0.82	0.140	0.62–1.07	0.89	0.573	0.58–1.35	0.78	0.169	0.55–1.11
Highest 20%				**0.61**	0.009	0.42–0.89	**0.48**	0.022	0.25–0.90	0.70	0.126	0.44–1.11
Gender												
Boy				1								
Girl				**1.40**	0.005	1.10–1.78						

Boldface indicates statistically significant ($p < 0.05$) aOR for the association between poor self-rated health and the given predictor, adjusting for all other coefficients in the model.

same-gender love whose odds for poor self-rated health, were similar to opposite-gender love adolescents of the same gender.

Reporting never having been in love was associated with lower odds for multiple symptoms. This is in line with our observation that not being in love is also a preventive factor in adolescent substance use.[55] Adolescents who did not answer the question on romantic love did not differ significantly from their opposite-gender love peers. Boys and girls reporting both-gender love had 4.3 times and 3.2 times the odds for multiple health symptoms, respectively, compared to opposite-gender love youth. Boys and girls reporting both-gender love also had 5.1 times and 2.6 times the odds for poor self-rated health, respectively. This pattern is in line with earlier findings on bisexual adolescents,[20,21] which suggests that they may experience more stress and greater health inequalities than those exclusively attracted to same-gender partners. Our findings partly correspond to a population survey with adults from Massachusetts, in which the self-rated poor or fair health of gay and lesbian individuals was not significantly different from that of heterosexual individuals, but bisexual respondents were significantly more likely to report poorer self-rated health. At the same time, all sexual minority respondents were more likely to feel limited by their health status.[56]

Adolescents reporting both-gender love were at even higher risk of multiple symptoms and poor subjective health than those reporting same-gender love. Both-gender attraction, or bisexuality, is often ''invisible'' or denied by the social environment. Bisexual individuals may be miscategorized as exclusively attracted to same or opposite-gender partners. They may experience rejection and biphobic harassment not just by heterosexual peers but also by those who identify as gay or lesbian.[42,43,57,58]

The ''mild'' effect of clustering (i.e., a low level of nonrandomness in how same-gender love and both-gender love young people were distributed in the sample)[59] may relate to the low and scattered presence of SMY among adolescents. In our sample, it would be hard to find a classroom where more than one student reported same-gender love or both-gender love. For many sexual minority individuals, adolescence may be an especially stressful and isolating life period,[60] especially if they have no supportive adults, peers, or role models.[61,62] Such isolation and lack of social and emotional support may also add to minority stress and its negative health consequences. Initiatives to attenuate the health inequalities among SMY, such as Gay-Straight Alliances or Gender-Sexuality Alliances,[63,64] have the additional benefits that they reduce loneliness and suicidality and increase social cohesion. Some of these positive effects have been observed not just in SMY youth but in heterosexual adolescents as well.[65–68]

Limitations

The limited number of adolescents reporting same-gender and both-gender love prevented us from disaggregating analyses by country/region. However, adjusting for gender, socioeconomic background, and regional differences did not yield substantially different odds ratios. This suggests that the poorer health of SMY is universal across the countries included in the study. As the data were cross-sectional, we cannot infer whether love for same- and both-gender partners is associated with poor subjective health at a later age. Self-reported health, similar to health status perceived by others, may also be influenced by sexual minority status.[69] We also acknowledge that love is just one facet of sexual orientation, and for a comprehensive picture, sexual desire, identity, and gender of sexual partners should also be investigated.[28] We used binary variables to determine the gender of both respondents' and their partners (boys or girls). This approach does not reflect the experience of young people whose gender identity does not match these binary categories nor those for whom the sex assigned at birth does not correspond with their gender identity.

There is evidence that nonbinary and transgender adolescents are especially vulnerable to health risks[70,71]; therefore, their identification in health surveys would be very important. The International HBSC Network is currently exploring how gender identity and sex assigned at birth can be included in the survey.

Conclusion

Our study provided cross-cultural evidence from eight European countries and regions, representing a diverse geographic and cultural range, that SMY are more vulnerable to reporting multiple health symptoms and rate their health as poorer than their peers in love with the opposite gender. Adolescents in love with both-gender partners were at higher risk than those who reported love exclusively with same-gender partners. Those who reported never having been in love had lower odds of reporting psychosomatic symptoms, while those who did not respond had similar odds to those who reported love for opposite-gender partners. These findings should inform European health policies to support interventions that reduce minority stress and consequent health inequalities in SMY. Future cross-national research should investigate whether adolescents in love with same- and both-gender partners are also vulnerable to risk behaviors and bullying and whether bullying mediates the association between same- or both-gender love and poor health outcomes. That physical and psychological symptoms and poor health are more frequent in SMY indirectly suggests long-term adverse health outcomes. Therefore, attending to the well-being of SMY may help in attenuating serious health inequalities in most countries.

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Disclaimer

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